Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) A container which can be sealed around at least 4 kg of bananas and which, when sealed around the bananas, has an O_2 permeability at 13 °C, per kg of bananas in the container (OP13/kg), of at least 700 ml/atm.24 hrs, an R ratio at 13 °C of at least 3, and an ethylene permeability at 13 °C, per kg of bananas in the container (EtOP13/kg) which is at least 3 times the OP13/kg of the container.

2. (Withdrawn) A container according to Claim 1 which can be sealed around 16-22 kg of bananas, and which, when so sealed, has an OP13/kg of at least 1500 ml/.atm.24 hrs.

3. (Withdrawn) A container according to Claim 1 which includes at least one permeable control member which (i) provides a pathway for O_2, CO_2 and ethylene to enter or leave the packaging atmosphere and (ii) comprises a gas-permeable membrane comprising

(a) a microporous polymeric film, and

(b) a polymeric coating on the microporous film.

4. (Withdrawn) A container according to Claim 3 wherein the gas-permeable membrane

(i) has a P_{10} ratio, over at least one 10°C range between -5 and 25 °C of at least 1.5, and

has an oxygen permeability (OTR), at all temperatures between 13 and 25°C, of at least 2,480,000 ml/m^2.atm.24 hrs (160,000 cc/100 inch^2.atm.24 hrs).

5. (Withdrawn) A container according to Claim 3 wherein the microporous polymeric film comprises a network of interconnected pores having an average pore size of less than 0.24 micron, with at least 70% of the pores having a pore size of less than 0.24 micron, and (ii).

6. (Withdrawn) A container according to Claim 5 wherein

(1) the pores in the microporous film constitute 35 to 80% by volume of the microporous film; and

(2) the microporous film comprises

(a) a polymeric matrix comprising (i) an essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least 18 deciliters/g, or (ii) an essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least 6 deciliters/g, or (iii) a mixture of (i) and (ii); and

(a) 30 to 90% by weight, based on the weight of the film, of a finely divided particulate substantially insoluble filler which is distributed throughout the film.

7. (Withdrawn) A container according to Claim 3 wherein the polymeric coating comprises a crystalline polymeric moiety which has a T_p of -5 to 25 °C, and which is a side chain crystalline polymer comprising units derived from (i) at least one n-alkyl acrylate or methacrylate in which the n-alkyl group contains at least 12 carbon atoms and (ii) one or more comonomers selected from acrylic acid, methacrylic acid, and esters of acrylic or methacrylic acid in which the esterifying group contains less than 10 carbon atoms.

8. (Withdrawn) A container according to Claim 3 wherein the polymeric coating comprises a block copolymer which has a heat of fusion ΔH of at least 5 J/g, and which comprises (i) polysiloxane polymeric blocks, and (ii) crystalline polymeric blocks having a melting point, T_p, of -5 to 40 °C.

9. (Withdrawn) A container according to Claim 3 wherein at least 75% of the O_2 which enters the packaging atmosphere, after the container has been sealed around the bananas, passes through said at least one atmosphere control member.

10. (Canceled)

11. (Currently amended) A package ~~according to Claim 10 wherein the~~ <u>which comprises</u>

<u>(a) a sealed container, and</u>

<u>(b) within the sealed container,</u> bananas <u>which</u> have not yet reached their climacteric, and <u>a packaging atmosphere around the bananas;</u>

<u>the sealed container having an O_2 permeability at 13 °C, per kg of bananas in the container (OP13/kg), of at least 1500 ml/atm.24 hrs, an R ratio at 13 °C of at least 3, and an ethylene permeability at 13 °C, per kg of bananas in the container (EtOP13/kg) which is at least 3 times the OP13/kg of the container; and</u> the packaging atmosphere <u>containing</u> ~~contains~~ 14 to 19% of O_2, and less than 10% of CO_2, with the total quantity of O_2 and CO_2 being less than 17 %.

12. (Original) A package according to Claim 11 wherein the container includes at least one permeable control member which provides a pathway for O_2, CO_2 and ethylene to enter or leave the packaging atmosphere and which comprises a gas-permeable membrane comprising

(a) a microporous polymeric film, and

(b) a polymeric coating on the microporous film.

13. (Original) A package according to Claim 12 wherein the gas-permeable membrane

(i) has a P_{10} ratio, over at least one 10°C range between -5 and 25 °C of at least 1.5, and

(ii) has an oxygen permeability (OTR), at all temperatures between 13 and 25°C, of at least 2,480,000 ml/m^2.atm.24 hrs (160,000 cc/100 inch^2.atm.24 hrs).

14. (Currently amended) A package according to Claim 13 wherein the microporous polymeric film comprises a network of interconnected pores having an average pore size of less than 0.24 micron, with at least 70% of the pores having a pore size of less than 0.24 micron. ~~micron, and (ii).~~

15. (Original) A package according to Claim 14 wherein

(1) the pores in the microporous film constitute 35 to 80% by volume of the microporous film; and

(2) the microporous film comprises

(a) a polymeric matrix comprising (i) an essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least 18 deciliters/g, or (ii) an essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least 6 deciliters/g, or (iii) a mixture of (i) and (ii); and

(b) 30 to 90% by weight, based on the weight of the film, of a finely divided particulate substantially insoluble filler which is distributed throughout the film.

16.(Currently amended) A package ~~according to Claim 10 wherein the~~ which comprises

(a) a sealed container, and

(b) within the sealed container, bananas which have passed their climacteric, and a packaging atmosphere around the bananas;

the sealed container having an O_2 permeability at 13 °C, per kg of bananas in the container (OP13/kg), of at least 1500 ml/atm.24 hrs, an R ratio at 13 °C of at least 3, and an ethylene permeability at 13 °C, per kg of bananas in the container (EtOP13/kg) which is at least 3 times the OP13/kg of the container;

the packaging atmosphere containing ~~contains~~ 1.5 to 6% of O_2, and less than 7%, of CO_2, with the total quantity of O_2 and CO_2 being less than ~~10%~~ 10 %; and

the bananas having been sealed within the container while they were green and having been ripened while in the sealed container.

17. (Original) A package according to Claim 16 wherein the container includes at least one permeable control member which provides a pathway for O_2, CO_2 and ethylene to enter or leave the packaging atmosphere and which comprises a gas-permeable membrane comprising

(a) a microporous polymeric film, and

(b) a polymeric coating on the microporous film.

18. (Original) A package according to Claim 17 wherein the gas-permeable membrane

(i) has a P_{10} ratio, over at least one 10°C range between -5 and 25 °C, of at least 1.5, and

(ii) has an oxygen permeability (OTR), at all temperatures between 13 and 25°C, of at least 2,480,000 ml/m^2.atm.24 hrs (160,000 cc/100 $inch^2$.atm.24 hrs).

19. (Original) A package according to Claim 18 wherein the microporous polymeric film comprises a network of interconnected pores having an average pore size of less than 0.24 micron, with at least 70% of the pores having a pore size of less than 0.24 micron, and (ii).

20. (Original) A package according to Claim 19 wherein

(1) the pores in the microporous film constitute 35 to 80% by volume of the microporous film; and

(2) the microporous film comprises

(a) a polymeric matrix comprising (i) an essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least 18 deciliters/g, or (ii) an essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least 6 deciliters/g, or (iii) a mixture of (i) and (ii); and

(c) 30 to 90% by weight, based on the weight of the film, of a finely divided particulate substantially insoluble filler which is distributed throughout the film.

REMARKS/ARGUMENTS

Amendments

Claim 10 has been canceled. Claims 11 and 16 have been rewritten in independent form to include all the limitations of claim 10, except that the requirement in claim 10 that the ethylene permeability should be at least 4 times the oxygen permeability has been changed to require that the ethylene permeability is at least 3 times the oxygen permeability. Basis for this change is to be found, for example, on page 5, lines 4-6, of the specification. Claim 16 has also been limited to require that the bananas were sealed within the container while they were green and were ripened by exposure to ethylene while they were in the sealed container. Basis for this limitation will be found on page 14, line 13 - page 16, line 19, of the specification. A minor correction has been made in claim 14.

As a result of these amendments, independent claim 11 is now limited to bananas which have not reached their climacteric, and independent claim 16 is limited to bananas which have passed their climacteric and which were ripened in the container.

The Rejection under 35 U.S.C. 103

Applicants respectfully traverse the rejection of claims 10-20 under 35 U.S.C. 103 as unpatentable over U.S. Patent No. 4,842,875 (hereinafter "Anderson") in view of U.S. Patent No. 5,045,331 (hereinafter "Antoon") and further in view of U.S. Patent No. 3,450,544 (hereinafter "Badran 544"), U.S. Patent No. 3,450,542 (hereinafter "Badran 542") and U.S. Patent No. 6,013,293 (hereinafter "DeMoor"), insofar as those rejections are applicable to the amended claims.

As discussed below, the teaching of the cited prior art is inconsistent and leads away from the invention as now claimed. The Office Action asserts, without reference to any of the detailed disclosure of the references,

> *the art taken as a whole clearly directs one to manipulate the various variables detailed above to achieve optimum results and one of ordinary skill in the art*

would therefore fairly led through routine experimentation to determine the various permeability ranges for bananas at any state of ripeness...

Applicant believes that the detailed disclosure of the references is of central importance, and shows conclusively that there is no basis for the assertions made in the Office Action. Particularly since the Office Action does not consider the detailed disclosure of the references, it is believed that it will be helpful first to summarize the relevant disclosure of each of the references.

<u>Summary of Anderson</u>

Anderson discloses the use of a microporous membrane as an atmosphere control member for packaging fruits and vegetables. Bananas are mentioned in the Background of the Invention (column 1, line 20) and in Table 1 (which "records published respiration rates and optimum storage conditions for several popular types of produce"), but are not elsewhere referred to in Anderson.

According to column 2, lines 37-53, and claim 1, the microporous membrane is a biaxially oriented film which

(i) is composed of a blend of propylene homopolymer and a propylene(95-98%)/ethylene(2-5%) copolymer, together with 40-60% of calcium carbonate; and

(ii) has an OTR of 77,500-465,000,000 cc/m^2-day-atm (the temperature at which the OTR is measured is not given).

Column 7, line 34, says that a microporous film normally has a carbon dioxide/oxygen permeance ratio (i.e. the quantity referred to in the present application as the R ratio) of about 1. All the membranes specifically disclosed by Anderson as examples of his invention are microporous polypropylene films having an R ratio of about 1.

Column 5, lines 14-21, says that "other film-forming polymers can be used", and that for optimum control, two separate control members of different R ratios can be used together, e.g. a microporous film having an R ratio of about 1, and another membrane having an R ratio such as 4-8. However, there is no disclosure in Anderson of any specific membrane having an R ratio substantially greater than 1. Column 4, lines 24-28, states that virtually all thin films of synthetic resins are permeable by oxygen or

carbon dioxide... and may have carbon dioxide/oxygen permeance ratios of 1 and higher. However, the reference then notes that monolithic and continuous sheets of film are not usually sufficiently permeable to avoid the use of excessively large panel areas/product weight ratios.

Column 2, lines 45-50, states

the permeance and area of the membrane being such as to provide a flux of oxygen approximately equal to the predicted oxygen respiration rate for not more than 3.0 kg of the enclosed food, vegetable or flower, and the carbon dioxide permeance of the membrane being such as to maintain the desired optimum ranges of carbon dioxide and oxygen for not more than said 3.0 kg of enclosed produce.

Table 1 in columns 3-4 sets out the reported respiration rate and desired atmosphere for a number of fruits and vegetables. With regard to "banana, ripening", Table 1 states that the respiration rate is 44 cc of oxygen/kg. hour, and that the desired atmosphere is 2-5 volume% of oxygen and 2-5 volume% of carbon dioxide. After the Table, column 4, lines 11-16, states:

Taking into consideration the respiration characteristics of the produce to be packaged and the optimum carbon dioxide and oxygen ranges required to retard its maturation, it is possible to design a container according to the invention for packaging any produce in substantially any quantity.

Anderson contains nothing to explain the inconsistency between (i) the requirement in claim 1 and column 2, lines 46-53, for "not more than 3.0 kg of the enclosed food, vegetable or flower" and (ii) the statement in column 4, lines 11-16, that any quantity of produce can be used.

Summary of Antoon

Antoon discloses an atmosphere control member (referred to by Antoon as a "panel") for use in packaging fruits and vegetables. Bananas are mentioned in the Background of the Invention (column 1, line 20) and in Table 1 (which "records published respiration rates and optimum storage conditions for several popular types of

produce"), but are not elsewhere referred to in Antoon. Antoon's atmosphere control member is composed of

> *resin-coated nonwoven material having a permeance ratio of carbon dioxide to oxygen* (i.e. the quantity referred to in this application as the R ratio) *between about 1 and 8 and having a permeance between about 5000 and 30,000,000 cc/100 in^2 /day/atmosphere (which is about 77,500 to 465,000,000 cc/m^2-day-atm, as in Anderson), the permeance and area of the panel being such as to provide a flux of oxygen approximately equal to the predicted oxygen respiration rate for not more than 3.0 kg of enclosed food, vegetable or flower and carbon dioxide permeance of the membrane being such as to maintain the desired optimum ranges of carbon dioxide and oxygen for not more than said 3.0 kg of enclosed produce.*

The resin coated onto the nonwoven material is preferably a cross-linked silicone resin, though other resins are mentioned in column 7, lines 18-25. The only specific panels disclosed by Antoon are composed of paper having a coating of a silicone resin thereon, and have an R ratio close to 1(1.03 in Example 1, and 1.38 in Example 2). Column 6, line 27, says that the preferred R ratio is 1.

Table 1 in column 3 sets out the respiration rate and desired atmosphere for a number of fruits and vegetables. As in Anderson, with regard to "banana, ripening", Table 1 states that the respiration rate is 44 cc of oxygen/kg. hour, and that the desired atmosphere is 2-5 volume% of oxygen and 2-5 volume% of carbon dioxide. After the Table, column 3, lines 64-68, states (as in Anderson):

> *Taking into consideration the respiration characteristics of the produce to be packaged and the optimum carbon dioxide and oxygen ranges required to retard its maturation, it is possible to design a container according to the invention for packaging any produce in substantially any quantity.*

Column 4, lines 46-48, states that the container can be of any required size, e.g. from as little as 100 cc up to several liters or more. Antoon contains nothing to explain the inconsistency between (i) the requirement in claim 1 and column 2, lines 52-56, for "not more than 3.0 kg of the enclosed food, vegetable or flower" and (ii) the statement in column 3 that any quantity of produce can be used.

Summary of Badran 542

Badran 542 relates to

*the holding of green bananas against ripening and the development of rots during storage and transportation incident to their delivery to the jobber or other destination for ultimate ripening in preparation for delivery to the consumer, and more particularly to a system for preventing the ripening of harvested green bananas so that they may be transported and/or warehoused from the point of origin, i.e. the farm or other assembly point, through to the destination for ripening... (*column 1, lines 23-32)

According to claim 1, the green bananas are placed in a container

formed at least in part of a flexible imperforate gas-permeable plastic sheet material having a thickness from 125-200 gauge and a permeability to oxygen of the order 2848 cc and to carbon dioxide of the order 4195 cc. both per mil per 100 in.^{2} per 24 hours at STP

the atmosphere surrounding the bananas, after five days or more,

containing less than 5.5% by volume of oxygen and less than 7% by volume of carbon dioxide,

and the bananas being ripenable

upon rupture of the sealed container to expose the contained bananas to a ripening atmosphere of increased oxygen and reduced carbon dioxide content.

The descriptive part of Badran 542 contains disclosure about the equilibrium oxygen and carbon dioxide concentrations which is a little different from claim 1. Thus, column 3, lines 29-32, states that the atmosphere within the sealed container is 1 to 5.5% oxygen and about 2.5 to about 7% carbon dioxide, with the percentage of carbon dioxide being greater than the percentage of oxygen.

Badran 542 discloses polyethylene film as the *flexible imperforate gas-permeable plastic sheet* which will result in the desired atmosphere within the container. The polyethylene films in the specific Examples have an R ratio of about 1.5. Films of other polymers are disclosed in column 7, lines 53-70, but with a warning that the present commercial forms of such polymers... *do not generally have as high oxygen diffusion*

rates as low density polyethylene, and, therefore, would have to be used in such thinness as to raise their carbon dioxide permeability too high, and with less tensile strength than is desirable.

Summary of Badran 544

Badran 544 relates to the storage of plant foods at have ripened through a climacteric, including bananas. Column 4, lines 1-8 states

> *Packaging of climacteric produce of the type referred to in this application at any time before the climacteric rise... has not been found to result in satisfactory storage life. Sealing the produce at any pre-climacteric stage appears to disrupt the ripening circle and when the package is opened, after any period of storage, the fruit fails to ripen in accordance with its normal cycle. It is essential, therefore, to package the produce after the onset of the climacteric...*

In the method described in Badran 544, the ripened foods are placed in an imperforate enclosure formed, at least in part, of flexible gas-permeable plastic sheet material. The enclosure is evacuated sufficiently to reduce the oxygen content thereof, and the enclosure is then sealed.

Badran 544 discloses polyethylene film as the gas-permeable plastic sheet material. The polyethylene films in the specific Examples have an R ratio of about 1.5. Films of other polymers are disclosed in column 6 lines 1-11, with a warning that the present commercial forms of such polymers... *do not generally have as high oxygen diffusion rates as low density polyethylene, and, therefore, would have to be used in such thinness as to raise their carbon dioxide permeability too high, and with less tensile strength than is desirable.*

The objective of Badran's procedure is to produce a package within which the oxygen content is between 1.4 and 10% and the carbon dioxide content is between 3.3 and 14.9% (Claim 1, column 14, lines 67-71), and more particularly, in the case of ripe bananas, an oxygen content between 1.4 and 2.4% and a carbon dioxide content between 8.0 and 12.0% (claim 11, column 16, line 75-column 17, line2).

Summary of DeMoor

DeMoor is relied upon the only for its disclosure of the use of a coated microporous film for gas-permeable produce packages. Applicant agrees that the gas-permeable membranes preferably used in the present invention are known for use in the packaging of fruits and vegetables in general (but not of bananas in particular). Such gas-permeable membranes are also disclosed in other references of record, for example U.S. Patent Nos. 6,376,032 and 6,548,132.

Argument

Claim 11

Claim 11 requires that the bananas have not yet reached their climacteric (i.e. which may be green bananas) and that the atmosphere around the bananas contains 14-19% of oxygen and less than 10% of carbon dioxide, with the total quantity of oxygen and carbon dioxide being less than 17%.

There are number of differences between claim 11 and the references, but for the present purposes, it is sufficient to examine the requirement for an oxygen content of 14-19% in the packaging atmosphere around the bananas, which have not yet reached their climacteric.

The primary reference, Anderson, and the secondary reference, Antoon, have very little to say about bananas, but do disclose that for "bananas,ripening", the desired atmosphere is 2-5 volume% of oxygen (see Table 1, column 3). Badran 542 is explicitly concerned with the ripening of green bananas, and teaches that the atmosphere should contain 1 to 5.5% oxygen (see column 3, lines 29-32). Badran 544 is explicitly concerned with the storage of ripe bananas and teaches that the green bananas should not be placed in a package at all (see column 4, lines 1-8). DeMoor says nothing about the packaging of bananas.

It is apparent that the references, so far from disclosing or suggesting the 14-19% oxygen content required by claim 11, teach away from such content by recommending a much smaller content, with a maximum of 5.5% in Badran 542 and a maximum of 5% in Anderson and Antoon.

Claim 16

Claim 16 requires that the bananas have passed their climacteric and that the atmosphere around the bananas contains 1.5-6 % of oxygen and less than 7% of carbon dioxide, with the total quantity of oxygen and carbon dioxide being less than 10%. Claim 16 also requires that the bananas should have been sealed in the container while they were green and ripened by exposure to ethylene while in the sealed container.

There are number of differences between claim 16 and the references, but for the present purposes, it is sufficient to examine the requirements in claim 16 that

(i) the carbon dioxide content in the packaging atmosphere around the post-climacteric bananas is less than 7%, and

(ii) the bananas were sealed into the container while they were green and ripened by exposure to ethylene while in the sealed container.

The primary reference, Anderson, and the secondary reference, Antoon, have very little to say about bananas, and what they do have to say is about "bananas,ripening". They have nothing to say about the appropriate atmosphere around bananas that have passed their climacteric. Badran 542 is explicitly concerned with the ripening of green bananas, and has nothing to say about the storage of bananas that have passed their climacteric. Badran 542 also notes that his sealed containers are broken open before the bananas contained therein are ripened (see column 3, lines 36-39, and claim 1). Badran 544 is explicitly concerned with the storage of ripe bananas, i.e. bananas that have passed their climacteric, and teaches that the atmosphere around the ripe bananas should contain 1.4-2.4 % of oxygen and 8.0-12.0 % of carbon dioxide (see claim 11, column 16, line 75 -column 17, line 2). Badran 544 also states emphatically that produce should not be placed within a sealed package at any pre-climacteric stage (see column 4, lines 1-8). DeMoor says nothing about the packaging of bananas.

It is apparent that the references do not disclose the carbon dioxide content of less than 7% required by claim 16. Furthermore, Badran 544 explicitly directs that the bananas should not be placed in the sealed package while they are green, as required by claim 16.

Information Disclosure Statements and Return of PTO 1449s

Applicant filed Information Disclosure Statements on April 26, 2002 (with 4 pages of PTO 1449), May 17, 2002 (with 5 pages of PTO 1449), January 8, 2003 (with 1 page of PTO 1449), and May 17, 2003 (with 1 page of PTO 1449). The Examiner is asked to sign and return the PTO 1449s to show that he has considered the listed documents. The Information Disclosure Statement filed on May 13, 2003, states that a copy of the Search Report issued by the European Patent Office is attached. It seems possible that a copy of that Search Report was not in fact attached to the Information Disclosure Statement, and for the avoidance of doubt, a copy of that Search Report is now attached.

Petition to (i) Issue Correct Filing Receipt, and (ii) correct US 2002/0090425

On May 12, 2003, Applicant filed a petition to (i) issue a correct filing receipt for this application, and (ii) correct the front page of Publication US 2002/0090425. No response to that petition has been received. The Examiner is requested to take whatever action is necessary to provide a decision on the petition.

CONCLUSION

It is believed that this application is now in condition for allowance, and applicant respectfully requests that a timely Notice of Allowance be issued in this case. If, however, there are any outstanding issues that could usefully be discussed by telephone, the Examiner is asked to call the undersigned.

Respectfully submitted,

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